

INTERNATIONAL ENERGY AGENCY

IMPLEMENTING AGREEMENT
FOR A CO-OPERATIVE PROGRAMME
ON PHOTOVOLTAIC POWER SYSTEMS
(as amended to 26th April 2006)

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TABLE OF CONTENTS

LIST OF ANNEXES	5
PREAMBLE.....	7
<i>Article 1</i>	
OBJECTIVES.....	8
<i>Article 2</i>	
IDENTIFICATION AND INITIATION OF TASKS	8
<i>Article 3</i>	
THE EXECUTIVE COMMITTEE	9
<i>Article 4</i>	
THE EXECUTIVE SECRETARY	12
<i>Article 5</i>	
THE OPERATING AGENTS	13

<i>Article 6</i>	
ADMINISTRATION AND STAFF.....	14
<i>Article 7</i>	
FINANCE	14
<i>Article 8</i>	
PROCUREMENT PROCEDURES	17
<i>Article 9</i>	
INFORMATION AND INTELLECTUAL PROPERTY	17
<i>Article 10</i>	
LEGAL RESPONSIBILITY AND INSURANCE	20
<i>Article 11</i>	
LEGISLATIVE PROVISIONS.....	20
<i>Article 12</i>	
ADMISSION AND WITHDRAWAL OF CONTRACTING PARTIES.....	21
<i>Article 13</i>	
SPONSORS.....	22
<i>Article 14</i>	
FINAL PROVISIONS	22
LIST OF CONTRACTING PARTIES AND SPONSOR.....	24
<i>Exhibit A</i>	
IEA FRAMEWORK FOR INTERNATIONAL ENERGY TECHNOLOGY CO-OPERATION	27

LIST OF ANNEXES

Annex I

EXCHANGE AND DISSEMINATION OF INFORMATION ON PHOTOVOLTAIC POWER SYSTEMS	27
---	----

Annex II

PERFORMANCE, RELIABILITY AND ANALYSIS OF PHOTOVOLTAIC SYSTEMS.....	31
--	----

Annex III

(Task completed; text not attached))

USE OF PHOTOVOLTAIC POWER SYSTEMS IN STAND-ALONE AND ISLAND APPLICATIONS	
--	--

Annex IV

(Task did not enter into force; text not attached)

MODELING OF DISTRIBUTED PHOTOVOLTAIC POWER GENERATION IN SUPPORT OF THE ELECTRIC GRID	
--	--

Annex V

(Task completed; text not attached)

GRID INTERCONNECTION OF BUILDING INTEGRATED AND OTHER DISPERSED PHOTOVOLTAIC POWER SYSTEMS	
---	--

Annex VI

(Task completed; text not attached)

DESIGN AND OPERATION OF MODULAR PHOTOVOLTAIC PLANTS FOR LARGE-SCALE POWER GENERATION	
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Annex VII

(Task completed; text not attached)

PHOTOVOLTAIC POWER SYSTEMS IN THE BUILT ENVIRONMENT	
---	--

Annex VIII

STUDY ON VERY LARGE SCALE PHOTOVOLTAIC POWER GENERATION SYSTEMS.....	35
--	----

Annex IX

PHOTOVOLTAIC SERVICES FOR DEVELOPING COUNTRIES.....	40
---	----

Annex X

URBAN SCALE PHOTOVOLTAIC APPLICATIONS.....	44
--	----

Annex XI

PHOTOVOLTAIC HYBRID SYSTEMS WITHIN MINI-GRIDS.....	49
--	----

INTERNATIONAL ENERGY AGENCY

**IMPLEMENTING AGREEMENT
FOR A CO-OPERATIVE PROGRAMME
ON PHOTOVOLTAIC POWER SYSTEMS**
(as amended to 26th April, 2006)

The Contracting Parties

CONSIDERING that the Contracting Parties, being either governments of International Energy Agency ("Agency") countries or parties designated by governments of Agency Member countries pursuant to Article III of the Guiding Principles for Co-operation in the Field of Energy Research and Development ("Guiding Principles") adopted by the Agency's Governing Board, as amended, wish to take part in the establishment and operation of a Co-operative Programme on Photovoltaic Power Systems (the "Programme");

CONSIDERING that the Contracting Parties, pursuant to Article IV of the Guiding Principles, wish to hold open to all governments of the Organisation for Economic Co-operation and Development ("OECD") countries, governments of non-OECD Member countries or international organizations in which such countries participate, or their designees, the opportunity to participate as Contracting Parties in the Programme;

CONSIDERING that the governments of Agency countries have agreed in Article 41 of the Agreement on an International Energy Program (the "I.E.P. Agreement") to undertake national programmes in the areas set out in Article 42 of the I.E.P. Agreement, including energy research and development, and have agreed in Chapter IV of the Long-Term Co-operation Programme, adopted by the Governing Board of the Agency on 30th January, 1976, to undertake co-operative activities including jointly financed programmes and projects in energy research and development;

CONSIDERING that the Governing Board of the Agency on 22nd October, 1992 approved the Programme as a special activity under Article 65 of the I.E.P. Agreement;

CONSIDERING that numerous proposals for international co-operation in the field of photovoltaic power systems were set forth at the Executive Conference on Photovoltaic Systems for Electric Utility Applications which the Agency sponsored in Taormina, Italy on 2nd-5th December, 1990;

CONSIDERING that the Agency has recognized the establishment of the Programme as an important component of international co-operation in the field of energy research and development;

HAVE AGREED as follows:

Article 1

OBJECTIVES

(a) *Scope of Activity.* The Programme to be carried out by the Contracting Parties within the framework of this Agreement shall consist of research, development, demonstration, analysis and information exchange related to photovoltaic power systems (PV) for application by electric utilities and other public and private users. A major part of the co-operative activity shall focus on current and potential markets for photovoltaic systems, according to a diffusion model which hypothesizes that the markets will gradually expand, from near-term applications of stand-alone and island photovoltaic systems not connected to the electric grid, to medium-term use of distributed photovoltaic systems which are connected to the electric grid but widely dispersed, and finally to longer-term use of large scale centralized photovoltaic systems which are built and operated by electric utilities or other producers. In addition, the co-operative activity shall include work on aspects of photovoltaic power systems which are relevant in all these potential markets, such as operational performance of photovoltaic components and information exchange on photovoltaic technology, economics, and impacts.

(b) *Method of Implementation.* The Contracting Parties shall implement the Programme by undertaking one or more tasks (the "Task" or "Tasks") each of which will be open to participation by two or more Contracting Parties as provided in Article 2 hereof. The Contracting Parties which participate in a particular Task are, for the purposes of that Task, referred to in this Agreement as "Participants".

(c) *Task Co-ordination and Co-operation.* The Contracting Parties shall co-operate in co-ordinating the work of the Tasks and shall endeavour, on the basis of an appropriate sharing of burdens and benefits, to encourage co-operation among Participants engaged in the Tasks with the objective of advancing the state of understanding of all Contracting Parties in the field of photovoltaic power systems.

Article 2

IDENTIFICATION AND INITIATION OF TASKS

(a) *Initial Task.* A Contracting Party may become a Participant in any Task identified in the Annexes hereto; such participation shall become effective upon the Contracting Party's giving the Executive Director of the Agency a written Notice of Participation in the appropriate Task Annex. Each Annex which is identified in the Annexes hereto at the time of the coming into force of this Agreement shall enter into force at such time as the Executive Committee, acting by unanimity of those Contracting Parties which have communicated to the Executive Director a Notice of Participation in that Annex, decides that there is sufficient participation to perform the Task.

(b) *Initiation of Additional Tasks.* Additional Tasks may be initiated by any Contracting Party according to the following procedure:

- (1) Whenever two or more Contracting Parties agree to undertake a new Task, they shall submit to the Executive Committee for adoption a draft Annex, similar in form to the Annexes attached hereto, containing a description of the scope of work and conditions of the Task proposed to be performed; the adopted Annex shall become part of this Agreement;
- (2) The participation in the adopted Annex of any Contracting Parties identified therein shall become effective upon the Contracting Party's giving the Executive Director of the Agency

a written Notice of Participation in that Annex. Article 12(c) shall apply for any Contracting Party that wishes to become a Participant in any Task after the respective Annex has been adopted by the Executive Committee;

- (3) In carrying out the various Tasks, the Participants shall co-ordinate their activities in order to avoid duplication of activities.

(c) *Application of Task Annexes.* Each Annex shall be binding only upon the Participants therein and upon the Operating Agent for that Task, and shall not affect the rights or obligations of other Contracting Parties.

Article 3

THE EXECUTIVE COMMITTEE

(a) *Supervisory Control.* Control of the Programme shall be vested in the Executive Committee constituted under this Article.

(b) *Membership.* The Executive Committee shall consist of one member designated by each Contracting Party; each Contracting Party shall also designate an alternate member to serve on the Executive Committee in the event that its designated member is unable to do so.

(c) *Responsibilities.* The Executive Committee shall:

- (1) Adopt for each year, acting by unanimity, the Programme of Work and Budget, if foreseen, for each Task, together with an indicative programme of work and budget for the following two years; the Executive Committee may, as required, make adjustments within the framework of the Programme of Work and Budget;
- (2) Make such rules and regulations as may be required for the sound management of the Tasks, including financial rules as provided in Article 7 hereof;
- (3) Carry out the other functions conferred upon it by this Agreement and the Annexes hereto;
- (4) Notify the IEA Secretariat of the intention to invite to any workshop, conference, meeting or similar event under the Programme any representative of any country that is not a member of the Agency, written notice of such intention to be given sufficiently in advance of the event to permit appropriate consultations and approval action to be taken within the Agency;
- (5) Consider any matters submitted to it by any of the Operating Agents or by any Contracting Party.

(d) *Procedures.* The Executive Committee shall carry out its responsibilities in accordance with the following procedures:

- (1) The Executive Committee shall each year elect a Chairman and one or more Vice-Chairmen;

- (2) The Executive Committee may establish such subsidiary bodies and rules of procedure as are required for its proper functioning;
- (3) A representative of the Agency and a representative of each Operating Agent (in its capacity as such) may attend meetings of the Executive Committee and its subsidiary bodies in an advisory capacity;
- (4) The Executive Committee shall meet in regular session not less than twice each year; a special meeting shall be convened upon the request of any Contracting Party which can demonstrate the need therefor;
- (5) Meetings of the Executive Committee shall be held at such time and in such office or offices as may be designated by the Committee;
- (6) At least twenty-eight days before each meeting of the Executive Committee, notice of the time, place and purpose of the meeting shall be given to each Contracting Party and to other persons or entities entitled to attend the meeting; notice need not be given to any person or entity otherwise entitled thereto if notice is waived before or after the meeting;
- (7) The quorum for the transaction of business in meetings of the Executive Committee shall be one-half of the members plus one (less any resulting fraction) provided that any action relating to a particular Task shall require a quorum as aforesaid of members or alternate members designated by the Participants in that Task;
- (8) The Executive Committee shall ensure that minutes of each meeting are distributed promptly after the meeting to each person or entity entitled to attend the meeting.

(e) Voting.

- (1) When the Executive Committee adopts a decision or recommendation concerning a particular Task, which the Executive Committee has previously approved, the Executive Committee shall act, subject always to Paragraph (5) below:
 - (i) for all decisions for which unanimity is required by this Agreement, by the affirmative vote of all ExCo members, or alternate member in the absence of the member, who are designated by the Participants in that Task and who are present and represented and are entitled to vote;
 - (ii) notwithstanding sub-paragraph (1)(i) above, for all decisions involving the Task's common fund or the Task's budget, by the affirmative vote, in person or pursuant to sub-paragraph (3) below, of all members, or alternate member in the absence of the member, who are designated by the Participants in that Task who are entitled to vote; and
 - (iii) when no express voting provision is made in this Agreement, then by the affirmative vote of a majority of those ExCo members, or alternate member in the absence of a member, who are designated by the Participants in that Task and are present or represented and are entitled to vote.
- (2) In all cases when the Executive Committee adopts a decision or recommendation concerning other than a particular Task, the Executive Committee shall act, subject always to Paragraph (5) below.
 - (i) for all decisions for which unanimity is required by this Agreement, by the

affirmative vote of all ExCo members, or alternate member in the absence of the member, who are present or represented and are entitled to vote;

- (ii) notwithstanding sub-paragraph (2)(i) above, for all decisions involving the common fund and the budget of the Implementing Agreement, by the affirmative vote, in person or pursuant to sub-paragraph (3) below, of all ExCo members, or alternate member in the absence of the member, entitled to vote; and
 - (iii) when no express voting provision is made in this Agreement, then by the affirmative vote of a majority of those ExCo members, or alternate member in the absence of a member, present or represented and entitled to vote.
 - (3) Should an Executive Committee member entitled to vote, or his/her designated alternate, be unable to attend an Executive Committee meeting, such Executive Committee member may grant a proxy to another Executive Committee member, or may communicate to the Executive Committee by mail, e-mail, telex or cable, or other means of electronic transmission, no later than five (5) days before the meeting, his/her vote on any decision or recommendation.
 - (4) The decisions and recommendations referred to in sub-paragraphs (1)-(3) above may, upon the reasonable request of any Executive Committee member, be made by written procedure by mail, e-mail, telex or cable, or other means of electronic transmission without the necessity for calling a meeting. In that case, the Executive Committee chair shall ensure that all Executive Committee members (a) receive the necessary documentation in relation to each decision or recommendation and (b) be given twenty-one (21) days to vote from the date of delivery of the written procedure documentation, or any other period as may be determined by the Executive Committee. The Executive Committee chair shall ensure that all members are informed of each decision or recommendation made pursuant to this sub-paragraph.
 - (5) The failure of any member, or alternate member in the absence of the member, to vote at a meeting, in person or pursuant to sub-paragraph (3) above, or the failure of any member, or alternate member in the absence of the member, to respond to a vote required by written procedure pursuant to sub-paragraph (4) above, shall be considered an abstention and such abstention shall not block an otherwise unanimous or majority vote.
 - (6) If a government has designated more than one Contracting Party to this Agreement, the members or alternate members designated by those Contracting Parties together may cast only one vote under this Article.
- (f) *Reports.* The Executive Committee shall, by 31st January each year, provide the Agency with 30 copies of reports containing technically substantive, non-proprietary information on the progress of the Programme and its results.

Article 4

THE SECRETARY

(a) *Designation; Scope of Authority.* The Executive Committee, acting by unanimity, may designate a secretary (the "Secretary") to:

- (1) Make and distribute agendas, minutes and other documents of Executive Committee meetings;
- (2) Prepare decisions and recommendations in accordance with Article 3(e)(4) hereof;
- (3) Assist the Executive Committee and its Chairman in carrying out their responsibilities under Articles 3(c)(4), 3(d)(8) and 3(f) of this Agreement;
- (4) Assist the Executive Committee in the overall co-ordination of the work in the different Annexes;
- (5) Undertake such other administrative activities as may be required by the Executive Committee to assist it in carrying out its responsibilities under this Agreement.

The Secretary shall carry out its functions under the supervision of the Executive Committee. Representatives of the Secretary may attend meetings of the Executive Committee and its subsidiary bodies in an advisory capacity with no voting rights.

(b) *Reimbursement of Costs.* The Executive Committee may provide that expenses and costs incurred by the Secretary under this Article shall be reimbursed to the Secretary from the common fund that the Executive Committee may establish under Article 7 hereof.

(c) *Replacement.* Should the Executive Committee wish to replace the Secretary with another entity, the Executive Committee may, acting by unanimity, take such action.

(d) *Resignation.* The Secretary shall have the right to resign at any time by giving six months written notice to that effect to the Executive Committee.

(e) *Information and Reports.* The Secretary shall furnish the Executive Committee such information concerning its work as the Executive Committee may request.

Article 5

THE OPERATING AGENTS

(a) *Designation.* Participants shall designate in the relevant Annex an Operating Agent for each Task. References in this Agreement to the Operating Agent shall apply to each Operating Agent in respect of the Task for which it is responsible.

(b) *Scope of Authority to Act on Behalf of Participants.* Subject to the provisions of the applicable Annex:

- (1) All legal acts required to carry out each Task shall be performed on behalf of the Participants by the Operating Agent for the Task;
- (2) The Operating Agent shall hold, for the benefit of the Participants, the legal title to all property rights which may accrue to or be acquired for the Task.

The Operating Agent shall operate the Task under its supervision and responsibility, subject to this Agreement, in accordance with the law of the country of the Operating Agent.

(c) *Specific Responsibilities.* The Operating Agent for each Annex shall be responsible for the overall technical and administrative management of the work under that Annex and for implementing the decisions of the Executive Committee. To this end, the Operating Agent for each Annex shall:

- (1) Prepare and submit annual reports to the Executive Committee on progress made on work under the Annex;
- (2) Upon request of the Executive Committee, convene annual meetings to be attended by all Participants in the Task, as well as meetings of working groups, where necessary, the cost of which will be borne by the Participants.

(d) *Reimbursement of Costs.* The Executive Committee may provide that expenses and costs incurred by an Operating Agent in acting as such pursuant to this Agreement shall be reimbursed to the Operating Agent from funds made available by the Participants pursuant to Article 7 hereof.

(e) *Replacement.* Should the Executive Committee wish to replace an Operating Agent with another government or entity, the Executive Committee may, acting by unanimity and with the consent of such government or entity, replace the initial Operating Agent. References in this Agreement to the "Operating Agent" shall include any government or entity appointed to replace the original Operating Agent under this paragraph.

(f) *Resignation.* An Operating Agent shall have the right to resign at any time by giving six months written notice to that effect to the Executive Committee, provided that:

- (1) A Participant, or entity designated by a Participant, is at such time willing to assume the duties and obligations of the Operating Agent and so notifies the Executive Committee and the other Participants to that effect, in writing, not less than three months in advance of the effective date of such resignation;
- (2) Such Participant or entity is approved in its function of Operating Agent by the Executive Committee, acting by unanimity.

(g) *Accounting.* An Operating Agent which is replaced or which resigns as Operating Agent shall, not

later than three months after such replacement or resignation takes effect, provide the Executive Committee with an accounting of any monies and other assets which it may have collected or acquired for the Task in the course of carrying out its responsibilities as Operating Agent and shall transfer those monies and other assets to the replacement Operating Agent as soon as possible after the delivery of the accounts.

(h) *Transfer of Rights.* In the event that another Operating Agent is appointed under paragraph (e) or (f) above, the Operating Agent shall transfer to such replacement Operating Agent any property rights which it may hold on behalf of the Task.

(i) *Information and Reports.* Each Operating Agent shall furnish to the Executive Committee such information concerning the Task as the Committee may request and shall each year submit, not later than two months after the end of the financial year, a report on the status of the Task.

Article 6

ADMINISTRATION AND STAFF

(a) *Administration of Tasks.* Each Operating Agent shall be responsible to the Executive Committee for implementing its designated Task in accordance with this Agreement, the applicable Task Annex, and the decisions of the Executive Committee.

(b) *Staff.* It shall be the responsibility of the Operating Agent to retain such staff as may be required to carry out its designated Task in accordance with rules determined by the Executive Committee. The Operating Agent may also, as required, utilize the services of personnel employed by other Participants (or organizations or other entities designated by Contracting Parties) and made available to the Operating Agent by secondment or otherwise. Such personnel shall be remunerated by their respective employers and shall, except as provided by the Executive Committee, be subject to their employers' conditions of service. The Contracting Parties shall be entitled to claim the appropriate cost of such remuneration or to receive an appropriate credit for such cost as part of the Budget of the Task, in accordance with Article 7(f)(6) hereof.

Article 7

FINANCE

(a) *Individual Financial Obligations.* Each Contracting Party shall bear the costs it incurs in carrying out this Agreement, including the costs of formulating or transmitting reports and of reimbursing its employees for travel and other per diem expenses incurred in connection with work carried out on the respective Tasks, unless provision is made for such costs to be reimbursed from common funds as provided in paragraph (h) below.

(b) *Common Financial Obligations.* The Executive Committee may agree, acting by unanimity, to establish a common fund to share the costs of its responsibilities and administrative activities set forth under Article 3 hereof. In addition, Participants wishing to share the costs of a particular Task may agree in the appropriate Task Annex to establish a separate common fund. The apportionment of contributions to such common funds (whether in the form of cash, services rendered, intellectual property or the supply of materials) as well as the management and use of such common funds shall be governed by the regulations and decisions made pursuant to this Article by the Executive Committee, acting by unanimity.

(c) *Financial Rules, Expenditure.* The Executive Committee, acting by unanimity, may make such regulations as are required for the sound financial management of each Task including, where necessary:

- (1) Establishment of budgetary and procurement procedures to be used by the Operating Agent in making payments from any common funds which may be maintained by Participants for the account of the Task or in making contracts on behalf of the Participants;
- (2) Establishment of minimum levels of expenditure for which Executive Committee approval shall be required, including expenditure involving payment of monies to the Operating Agent for other than routine salary and administrative expenses previously approved by the Executive Committee in the budget process.

In the expenditure of common funds, the Operating Agent shall take into account the necessity of ensuring a fair distribution of such expenditure in the Participants' countries, where this is fully compatible with the most efficient technical and financial management of the Task.

(d) *Crediting of Income to Budget.* Any income which accrues from a Task shall be credited to the Budget of that Task.

(e) *Accounting.* The system of accounts employed by the Operating Agent shall conform to accounting principles generally accepted in the country of the Operating Agent and shall be consistently applied.

(f) *Programme of Work and Budget, Keeping of Accounts.* Should Participants agree to maintain common funds for the payment of obligations under a programme of work and budget of the Task, the following provisions shall be applicable unless the Executive Committee, acting by unanimity, decides otherwise:

- (1) The financial year of the Task shall correspond to the financial year of the Operating Agent.
- (2) The Operating Agent shall each year prepare and submit to the Executive Committee for approval a draft programme of work and budget, together with an indicative programme of work and budget for the following two years, not later than three months before the beginning of each financial year; the Executive Committee shall then transmit the final programme, once approved, to the Agency and to the members of the Agency's Committee on Energy Research and Technology.
- (3) The Operating Agent shall maintain complete and separate financial records which shall clearly account for all funds and property coming into the custody or possession of the Operating Agent in connection with the Task.
- (4) Not later than three months after the close of each financial year the Operating Agent shall submit to auditors selected by the Executive Committee for audit the annual accounts maintained for the Task; upon completion of the annual audit, the Operating Agent shall present the accounts together with the auditors' report to the Executive Committee for approval.
- (5) All books of account and records maintained by the Operating Agent for the Task shall be preserved for at least three years from the date of termination of the Task.

- (6) Where provided in the relevant Annex, a Participant supplying services, materials or intellectual property to the Task shall be entitled to a credit, determined by the Executive Committee, acting by unanimity, against its contribution (or to compensation, if the value of such services, materials or intellectual property exceeds the amount of the Participant's contribution); such credits for services of staff shall be calculated on an agreed scale approved by the Executive Committee and shall include all payroll-related costs.
- (g) *Currency of Contributions.* Contributions due hereunder from the Contracting Parties shall be paid in the currency of the Operating Agent, unless another currency is specified by the Operating Agent in agreement with the Executive Committee for the purpose of meeting a commitment in that currency.
- (h) *Contribution to Common Funds.* Should Participants agree to establish common funds under the annual Programme of Work and Budget for a Task, any financial contributions due from Participants in a Task shall be paid to the Operating Agent in the currency of the country of the Operating Agent at such times and upon such other conditions as the Executive Committee, acting by unanimity, shall determine, provided, however, that:
- (1) Contributions received by the Operating Agent shall be used solely in accordance with the Programme of Work and Budget for the Task;
 - (2) The Operating Agent shall be under no obligation to carry out any work on the Task until contributions amounting to at least fifty per cent (in cash terms) of the total due at any one time have been received.
- (i) *Ancillary Services.* Ancillary services may, as agreed between the Executive Committee and the Operating Agent, be provided by that Operating Agent for the operation of a Task and the cost of such services, including overheads connected therewith, may be met from budgeted funds of that Task.
- (j) *Taxes.* The Operating Agent shall pay all taxes and similar impositions (other than taxes on income) imposed by national or local governments and incurred by it in connection with a Task, as expenditure incurred in the operation of that Task under the Budget; the Operating Agent shall, however, endeavour to obtain all possible exemptions from such taxes.
- (k) *Audit.* Each Participant shall have the right, at its sole cost, to audit the accounts of any work in a Task for which common funds are maintained on the following terms:
- (1) The Operating Agent shall provide the other Participants with an opportunity to participate in such audits on a cost-shared basis;
 - (2) Accounts and records relating to activities of the Operating Agent other than those conducted for the Task shall be excluded from such audit, but if the Participant concerned requires verification of charges to the Budget representing services rendered to the Task by the Operating Agent, it may, at its own cost, request and obtain an audit certificate in this respect from the auditors of the Operating Agent;
 - (3) Not more than one such audit shall be required in any financial year;
 - (4) Any such audit shall be carried out by not more than three representatives of the Participants.

Article 8

PROCUREMENT PROCEDURES

All procurement of equipment and material shall be in accordance with the procedures laid down by the Executive Committee under Article 7(c)(1) hereof, which shall provide, inter alia:

- (1) The Operating Agent of each Annex shall have the power to enter into agreements and contracts for all necessary support, design and developmental services, and material fabrication and facility construction activities in the interest of the Annex, provided that such agreements and contracts are authorized in an approved Budget or by the provisions of this Agreement or by the express authorization of the Executive Committee;
- (2) No Operating Agent shall enter into any agreement for a total value of more than US \$10,000 without the approval of the Executive Committee;
- (3) The Operating Agent for each Annex shall perform all procurement functions that may be necessary to carry out activities under the Annex, in accordance with the procurement procedures adopted by the Executive Committee pursuant to Article 7(c)(1) hereof;
- (4) Consistent with the aforementioned procurement procedures, the Operating Agent shall undertake to secure the best contractual terms and conditions available, including, where possible, provision for title to all intellectual property generated under the Agreement, for a royalty-free licence for the use of background intellectual property for the purposes of the Task alone, and for a right on reasonable terms and conditions in accordance with Article 9 hereof for the Contracting Parties to use such background intellectual property commercially.

Article 9

INFORMATION AND INTELLECTUAL PROPERTY

(a) *Application to Agreement and Annexes.* Pursuant to the General Guidelines Concerning Information and Intellectual Property, approved by the Governing Board of the Agency on 21st November, 1975, and any modification thereof, the following information and intellectual property provisions shall generally apply to this Agreement and each of its constituent Annexes. Exceptions and additions to these provisions may be made in any particular Annex, in which case they shall apply to that Annex alone.

(b) *Executive Committee's Powers.* The publication, distribution, handling, protection and ownership of information and intellectual property provided under or arising from each Annex shall be determined by the Executive Committee, acting by unanimity, in conformity with this Agreement and the laws of the countries of the Participants.

(c) *Proprietary Information.* The Operating Agent and the Participants shall take all necessary measures in accordance with this Article, the laws of their respective countries, and international law to protect proprietary information. For the purposes of this Article, proprietary information shall mean information of a confidential nature such as trade secrets and know-how (for example, computer programmes, design procedures and techniques, chemical composition of materials, and manufacturing methods, processes or treatments) which:

- (1) Is not generally known or publicly available from other sources;
- (2) Has not previously been made available by the owner to others without obligation concerning its confidentiality; and
- (3) Is not already in the possession of the recipient Participant without obligation concerning its confidentiality.

It shall be the responsibility of each Participant supplying proprietary information to identify the information as such and to ensure that it is appropriately marked.

(d) *Production of Relevant Information by Governments.* The Operating Agent should encourage the governments of all Agency Participating Countries to make available or to identify to the Operating Agent all published or otherwise freely available information known to them that is relevant to the performance of the work under each Annex. The Participants in each Annex should notify the Operating Agent of all pre-existing information, and information developed independently of the Annex known to them which is relevant to the Annex and which can be made available without contractual or legal limitations.

(e) *Production of Available Information by Participants.* Each Participant in an Annex agrees to provide to the Operating Agent all previously existing information and information developed independently of the Annex which is needed by the Operating Agent to carry out its functions in that Annex, which is freely at the disposal of the Participant, and the transmission of which is not subject to any contractual and/or legal limitations:

- (1) If no substantial cost is incurred by the Participant in making such information available, at no charge to the Annex;
- (2) If substantial costs must be incurred by the Participant to make such information available, at such charge to the Annex as shall be agreed between the Operating Agent and the Participant with the approval of the Executive Committee.

(f) *Use of Proprietary Information.* If a Participant in an Annex has access to proprietary information which would be useful to the Operating Agent in conducting studies, assessments, analyses, or evaluations, such information may be communicated to the Operating Agent in accordance with an agreement between the Operating Agent and the specific Participant setting forth the terms and conditions for such acceptance; but the proprietary information shall not become part of reports, handbooks, or other documentation, nor be communicated to the other Participants, except as may be agreed in writing between the Operating Agent and the Participant which supplied such information.

(g) *Arising Proprietary Information.* It shall be the responsibility of the Operating Agent to identify information arising from each Task which qualifies as proprietary information under this Article and to ensure that it is appropriately marked. If any Contracting Party questions the decision of the Operating Agent regarding the proprietary nature of arising information, the question shall be submitted to the Executive Committee for decision. Proprietary information arising from any Task shall be the property of the Operating Agent for the benefit of the Participants in the Task. The Operating Agent shall license such proprietary information for non-exclusive use as follows:

- (1) To each Participant in the Task:
 - (i) On the most favourable terms and conditions for use by the Participant in its own country;
 - (ii) On favourable terms and conditions for the purpose of sub-licensing others for use in its own country.

In each case, the terms and conditions are to be stipulated by the Executive Committee taking into account the equities of the Participants based upon the sharing of obligations, contributions, rights and benefits of all Participants;

- (2) Subject to sub-paragraph (1) above, to each Participant in the Task for use in all countries, on reasonable terms and conditions stipulated by the Executive Committee taking into account the equities of the Participants based upon the sharing of obligations, contributions, rights and benefits of all Participants;
- (3) To the government of any Agency country and nationals designated by it, for use in such country in order to meet its energy needs, on terms and conditions stipulated by the Executive Committee taking into account any equitable conditions which might arise from the support provided by the Agency to the Task;
- (4) To entities and persons not mentioned above in this paragraph, if agreed by the Executive Committee, on terms and conditions stipulated by the Executive Committee.

(h) *Acquisition of Information.* Each Participant in an Annex shall inform the Operating Agent of the existence of information known to the Participant that can be of value to the Annex, but which is not freely available, and the Participant shall endeavour to make the information available to the Annex under reasonable conditions.

(i) *Exchange of Information with Others.* The Executive Committee may, acting by unanimity, make arrangements for the acquisition of information from sources other than the Participants in an Annex. The Executive Committee shall, acting by unanimity, determine the rules by which information available to Participants in an Annex may be made available to governments, utilities, research institutions, and other appropriate entities of countries which do not participate in an Annex.

(j) *Reports on Work Performed.* The Operating Agent of each Annex shall provide to the Participants reports on all work performed under the Annex and the results thereof, including studies, assessments, analyses, evaluations and other documentation, but excluding proprietary information.

(k) *Copyright.* The Operating Agent of each Annex may take appropriate measures necessary to protect copyrightable material generated under that Annex. Copyrights obtained shall be held by the Operating Agent for the benefit of the Annex Participants, in accordance with Article 5(b)2 hereof. Participants may reproduce and distribute such material, but shall not publish it with a view to profit, except as agreed by the Executive Committee, acting by unanimity.

(l) *Authors.* Each Participant shall, without prejudice to any rights of authors under its national laws, take necessary steps to provide the co-operation with its authors required to carry out the provisions of this paragraph. Each Participant will assume the responsibility to pay awards or compensation required to be paid to its employees according to the laws of its country.

(m) *Access to Information and Reports.* Participants in each Annex shall be entitled without charge to have access to the information and reports produced by the Operating Agent of that Annex. The Executive Committee shall lay down guidance as to the use any Participant may make of the information and, where appropriate, the charges to be imposed.

(n) *Effect of Termination or Withdrawal.* The Executive Committee shall, at the time of the termination of this Agreement or the withdrawal of any Contracting Party, adopt appropriate measures for the subsequent application of the obligations of paragraph (m) above and related questions, which may include guidance as to the use any previous Participant may make of the information and, where appropriate, the charges to be imposed.

Article 10

LEGAL RESPONSIBILITY AND INSURANCE

(a) *Liability of the Operating Agent.* The Operating Agent shall use all reasonable skill and care in carrying out its duties under this Agreement in accordance with all applicable laws and regulations. Except as otherwise provided in this Article, the cost of all damage to property, and all expenses associated with claims, actions, and other costs arising from work approved by the Executive Committee and undertaken with common funds for a Task shall be charged to the Budget of that Task; such costs and expenses arising from other work undertaken for a Task shall be charged to the Budget of that Task if the Task Annex so provides or the Executive Committee, acting by unanimity, so decides.

(b) *Insurance.* The Operating Agent shall propose to the Executive Committee all necessary liability, fire and other insurance, and shall carry such insurance as the Executive Committee may direct. The cost of obtaining and maintaining insurance shall be charged to the Budget of the Task.

(c) *Responsibility of the Operating Agent.* The Operating Agent shall, in accordance with the laws of the country of the Operating Agent, be responsible in its capacity as such, for any damage to property and all legal liabilities, actions, claims, costs and expenses connected therewith to the extent that they:

- (1) Result from the failure of the Operating Agent to maintain such insurance as it may be required to maintain under paragraph (b) above; or
- (2) Result from the gross negligence or wilful misconduct of any officers or employees of the Operating Agent in carrying out their duties under this Agreement.

Article 11

LEGISLATIVE PROVISIONS

(a) *Accomplishment of Formalities.* Each Participant shall request the appropriate authorities of its country (or its Member States in the case of an international organization) to use their best endeavours, within the framework of applicable legislation, to facilitate the accomplishment of formalities involved in the movement of persons, the importation of materials and equipment and the transfer of currency which shall be required to conduct the Task in which it is engaged.

(b) *Appropriation of Funds and Applicable Laws.* In carrying out this Agreement and its Annexes the Contracting Parties shall be subject to the appropriation of funds by the appropriate governmental authority, where necessary, and to the constitutions, laws and regulations applicable to the respective Contracting Parties, including, but not limited to, laws establishing prohibitions upon the payment of commissions, percentages, brokerage or contingent fees to persons retained to solicit governmental contracts and upon any share of such contracts accruing to governmental officials.

(c) *Decisions of Agency Governing Board.* Notwithstanding Article 7 of the IEA Framework for International Energy Technology Co-operation, adopted by the IEA Governing Board on 3 April 2003, the Framework shall apply to, and be an integral part of, this Agreement from 27 October 2005. A copy of the Framework is attached as Exhibit A to this Implementing Agreement.

(d) *Settlement of Disputes.* Any dispute among the Contracting Parties concerning the interpretation or the application of this Agreement which is not settled by negotiation or other agreed mode of settlement shall be referred to a tribunal of three arbitrators to be chosen by the Contracting Parties concerned who shall also choose the Chairman of the tribunal. Should the Contracting Parties concerned fail to agree upon the composition of the tribunal or the selection of its Chairman, the President of the International Court of Justice shall, at the request of any of the Contracting Parties concerned, exercise those responsibilities. The tribunal shall decide any such dispute by reference to the terms of this Agreement and any applicable laws and regulations, and its decision on a question of fact shall be final and binding on the Contracting Parties concerned. Operating Agents which are not Contracting Parties shall be regarded as Contracting Parties for the purpose of this paragraph.

Article 12

ADMISSION AND WITHDRAWAL OF CONTRACTING PARTIES

(a) *Admission of New Contracting Parties.* Upon the invitation of the Executive Committee, acting by unanimity, admission to this Agreement shall be open to:

- (1) the governments of both OECD member or OECD non-member countries;
- (2) the European Communities;
- (3) international organizations in which the governments of OECD member countries and/or OECD non-member countries participate; and
- (4) any national agency, public organization, private corporation or other entity designated by the government of an OECD member country or an OECD non-member country, or by the European Communities

(b) *Conditions of Participation.* The Executive Committee shall establish the terms and conditions for the admission, participation and withdrawal of Contracting Parties, including their rights and obligations, subject always to the IEA Framework for International Energy Technology Co-operation as adopted by the Governing Board of the Agency on 3 April 2003, and any amendments thereto.

(c) *Admission of New Participants in Tasks.* Any Contracting Party may, with the agreement of the Participants in a Task, acting by unanimity, become a Participant in that Task. Such participation shall become effective upon the Contracting Party's giving the Executive Director of the Agency a Notice of Participation in the appropriate Task Annex and the adoption of consequential amendments thereto.

(d) *Contributions.* The Executive Committee may require, as a condition to admission to participation, that the new Contracting Party or new Participant shall contribute (in the form of cash, services, materials or intellectual property) an appropriate proportion of the prior budget expenditure of any Task in which it participates.

(e) *Replacement of Contracting Parties.* With the agreement of the Executive Committee, acting by unanimity, and upon the request of a government, a Contracting Party designated by that government may be replaced by another party. In the event of such replacement, the replacement party shall assume the rights and obligations of a Contracting Party as provided in paragraph (a) above and in accordance with the procedure provided therein.

(f) *Withdrawal.* Any Contracting Party may withdraw from this Agreement or from any Task either

with the agreement of the Executive Committee, acting by unanimity, or by giving twelve months written Notice of Withdrawal to the Executive Director of the Agency, such notice to be given not less than one year after the date hereof. The withdrawal of a Contracting Party under this paragraph shall not affect the rights and obligations of the other Contracting Parties; except that, where the other Contracting Parties have contributed to common funds for a Task, their proportionate shares in the Task Budget shall be adjusted to take account of such withdrawal.

(g) *Changes of Status of Contracting Party.* A Contracting Party other than a government or an international organization shall forthwith notify the Executive Committee of any significant change in its status or ownership, or of its becoming bankrupt or entering into liquidation. The Executive Committee shall determine whether any such change in status of a Contracting Party significantly affects the interests of the other Contracting Parties; if the Executive Committee so determines, then, unless the Executive Committee, acting upon the unanimous decision of the other Contracting Parties, otherwise agrees:

- (1) That Contracting Party shall be deemed to have withdrawn from the Agreement under paragraph (f) above on a date to be fixed by the Executive Committee; and
- (2) The Executive Committee shall invite the Government which designated that Contracting Party to designate, within a period of three months of the withdrawal of that Contracting Party, a different entity to become a Contracting Party; if approved by the Executive Committee, acting by unanimity, such entity shall become a Contracting Party with effect from the date on which it signs or accedes to this Agreement and gives the Executive Director of the Agency a Notice of Participation in one or more Annexes.

(h) *Failure to Fulfil Contractual Obligations.* Any Contracting Party which fails to fulfil its obligations under this Agreement within sixty days after its receipt of notice, specifying the nature of such failure and invoking this paragraph, may be deemed by the Executive Committee, acting by unanimity, to have withdrawn from this Agreement.

Article 13

SPONSORS

Upon the invitation of the Executive Committee, acting by unanimous vote, participation shall be open to Sponsors, as that category of Participants is defined, and as otherwise set forth, in the IEA Framework.

Article 14

FINAL PROVISIONS

(a) This Agreement shall be open for signature, until 24th May, 1993, by any Agency Participating Country (or a national agency, public organization, private corporation, company or other entity designated by such government).

(b) *Term of Agreement.* This Agreement shall enter into force upon signature by two or more Contracting Parties and shall remain in force for an initial period of five years. The term of the Agreement may be extended for such additional periods as may be determined by the Executive Committee, acting by unanimity, with the prior approval of the Governing Board of the Agency. The Executive Committee may, acting by unanimity, terminate this Agreement at any time.

(c) *Legal Relationship of Contracting Parties and Participants.* Nothing in this Agreement shall be regarded as constituting a partnership between any of the Contracting Parties or Participants.

(d) *Termination.* Upon termination of this Agreement, or any Annex to this Agreement, the Executive Committee, acting by unanimity, shall arrange for the liquidation of the assets of the Task or Tasks. In the event of such liquidation, the Executive Committee shall, so far as practicable, distribute the assets of the Task, or the proceeds therefrom, in proportion to the contributions which the Participants have made from the beginning of the operation of the Task, and for that purpose shall take into account the contributions and any outstanding obligations of former Contracting Parties. Disputes with a former Contracting Party about the proportion allocated to it under this paragraph shall be settled under Article 11(d) hereof, for which purpose a former Contracting Party shall be regarded as a Contracting Party.

(e) *Amendment.* This Agreement may be amended at any time by the Executive Committee, acting by unanimity, and any Annex to this Agreement may be amended at any time by the Executive Committee, acting by unanimity of the Participants in the Task to which the Annex refers. Such amendments shall come into force in a manner determined by the Executive Committee, acting under the voting rule applicable to the decision to adopt the amendment.

(f) *Deposit.* The original of this Agreement shall be deposited with the Executive Director of the Agency and a certified copy thereof shall be furnished to each Contracting Party and to the Operating Agents. A copy of this Agreement shall be furnished to each Agency Participating Country and to each Member country of the Organisation for Economic Co-operation and Development.

Done in Paris, this 24th day of November, 1992.

As amended on 26 April 2006

LIST OF CONTRACTING PARTIES

(AS OF 22 JUNE 2009)

The **ENERGY RESEARCH AND DEVELOPMENT CORPORATION (ERDC)** (Australia)

The Verband der Elektrizitätswerke Österreichs (Austria)
(replaced by **ARSENAL RESEARCH GES.M.B.H.**)

The **GOVERNMENT OF CANADA**

The **COMMISSION OF THE EUROPEAN COMMUNITIES**

The Ministry of Energy, Danish Energy Agency
replaced by the Ministry of Environment and Energy, Danish Energy Agency,
then by the **MINISTRY OF ECONOMY AND BUSINESS AFFAIRS, DANISH ENERGY AUTHORITY**

L'AGENCE DE L'ENVIRONNEMENT ET DE LA MAÎTRISE DE L'ÉNERGIE (ADEME) (France)

FORSCHUNGSZENTRUM JÜLICH GMBH (Germany)

The **MINISTRY OF ENERGY AND INFRASTRUCTURE OF THE STATE OF ISRAEL***

ENTE PER LE NUOVE TECNOLOGIE, L'ENERGIA E L'AMBIENTE (ENEA) (Italy)

ENEL S.p.A. (Italy)
(replaced by CESI – Centro Elettrotecnico Sperimentale Italiana SpA,
and then replaced by CESI Ricerca S.p.A.
which later changed its name to **ENEA RICERCA SUL SISTEMA ELETTRICO (ERSE S.p.A.)**)

The **NEW ENERGY AND INDUSTRIAL TECHNOLOGY DEVELOPMENT ORGANIZATION (NEDO)**
(Japan)

The Ministry of Trade, Industry and Energy (Korea)*
(name changed to **MINISTRY OF COMMERCE, INDUSTRY AND ENERGY (MOCIE)**)

PUSAT TENAGA MALAYSIA (PTM)

The **INSTITUTO DE INVESTIGACIONES ELÉCTRICAS (IIE)** (Mexico)

The Netherlands Agency for Energy and the Environment (NOVEM)
(renamed following merger with Senter to **SENTERNOVEM**)

THE RESEARCH COUNCIL OF NORWAY

THE NATIONAL INSTITUTE FOR ENGINEERING AND INDUSTRIAL TECHNOLOGY (INETI) (Portugal)

THE SECRETARY OF ENERGY AND MINERAL RESOURCES (Spain)

* Signed as Associates; now full Contracting Party status.

The Swedish National Board for Industrial and
Technical Development (NUTEK)
(replaced by the Swedish National Energy Administration,
which later changed its name to **THE SWEDISH ENERGY AGENCY**)

THE FEDERAL OFFICE OF ENERGY (Switzerland)

AEA Technology (United Kingdom)
(replaced by the Department of Trade and Industry,
which later changed its name to the Department for Business, Enterprise and Regulatory Reform,
which was later replaced by **THE DEPARTMENT OF ENERGY AND CLIMATE CHANGE (DECC)**)

The Government of the United States of America
(replaced by **THE UNITED STATES DEPARTMENT OF ENERGY**)

CONTRACTING PARTIES SINCE WITHDRAWN

The HELSINKI UNIVERSITY OF TECHNOLOGY (Finland)¹

**THE MARMARA RESEARCH CENTRE (MAM) OF THE
SCIENTIFIC AND TECHNICAL RESEARCH COUNCIL OF TURKEY**

SPONSOR

EUROPEAN PHOTOVOLTAIC INDUSTRY ASSOCIATION (EPIA)

¹ Finland withdrew from the Agreement effective as of 30 September 2005.

Final CoPV 13.10.2006 revised AL 23.10.06 clean.doc

EXHIBIT A
IEA FRAMEWORK FOR INTERNATIONAL ENERGY
TECHNOLOGY CO-OPERATION

I. General Principles

Article 1

Mandate

- 1.1 In fulfilment of Chapter VII of the Agreement on an International Energy Program and in light of the Shared Goals of the IEA, the IEA operates Implementing Agreements to enable IEA Member countries to carry out programmes and projects on energy technology research, development and deployment.
- 1.2 An Implementing Agreement is a contractual relationship established by at least two IEA Member countries, and approved by the Governing Board, for the purpose set out in Article 1.1.
- 1.3 Participants in an Implementing Agreement shall contribute as fully as possible to the achievement of its objectives and shall endeavour to secure, through public and private support, the necessary scientific, technical and financial resources for the programmes and projects carried out under such an Implementing Agreement.
- 1.4 Each Implementing Agreement shall have an Executive Committee composed of representatives of all participants.

Article 2

Nature of Implementing Agreements

- 2.1 The activities of an Implementing Agreement may include, *inter alia*:
 - (a) co-ordination and planning of specific energy technology research, development and deployment studies, works or experiments carried out at a national or international level, with subsequent exchange, joint evaluation and pooling of the scientific and technical results acquired through such activities;
 - (b) participation in the operation of special research or pilot facilities and equipment provided by a participant, or the joint design, construction and operation of such facilities and equipment;
 - (c) exchange of information on (i) national programmes and policies, (ii) scientific and technological developments and (iii) energy legislation, regulations and practices;
 - (d) exchanges of scientists, technicians or other experts;
 - (e) joint development of energy related technologies; and
 - (f) any other energy technology related activity.

- 2.2 Participation in an Implementing Agreement shall be based on equitable sharing of obligations, contributions, rights and benefits. Participants in an Implementing Agreement shall undertake to make constructive contributions, whether technical, financial or otherwise, as may be agreed by the Executive Committee.
- 2.3 Some or all of the participants in an Implementing Agreement may choose to execute specific projects and/or programmes through Annexes to the Implementing Agreement.

II. Rules Applicable to IEA Implementing Agreements

Article 3

Participation, Admission and Withdrawal

- 3.1 An Implementing Agreement can be established by two or more IEA Member countries subject to approval of the Committee on Energy Research and Technology (CERT) and of the Governing Board. There are two possible categories of participants in Implementing Agreements: Contracting Parties and Sponsors.
- 3.2 Contracting Parties may be
- (a) the governments of both OECD member or OECD non-member countries;
 - (b) the European Communities;
 - (c) international organisations in which the governments of OECD member countries and/or OECD non-member countries participate; and
 - (d) any national agency, public organisation, private corporation or other entity designated by the government of an OECD member country or an OECD non-member country, or by the European Communities.
- 3.2.1 Participation in any Implementing Agreement for OECD non-member countries or for international organisations requires prior approval by the CERT. However, should the CERT consider a first time application by an OECD non-member country or an international organisation to be sensitive, it may refer the decision to the Governing Board as it deems appropriate.
- 3.2.2 Prior to CERT approval of participation of OECD non-member countries or international organisations in any Implementing Agreement, the Executive Committee shall:
- (a) have voted in favour of the applicant to join the Implementing Agreement and provide evidence of the same to the CERT;

(b) provide the CERT with a copy of the terms and conditions of the applicant's participation in the Implementing Agreement; and

(c) provide the CERT with a letter from the applicant expressing the applicant's desire to join the Implementing Agreement and specifying which Annexes it wishes to join; its acceptance of the terms and conditions of the Implementing Agreement; the name of its designated entity if it is not the applicant itself; and the name of the entity that will sign the Implementing Agreement.

3.2.3 The terms and conditions for the admission, participation and withdrawal of Contracting Parties, including their rights and obligations, in Implementing Agreements and their Annexes, if any, shall be established by the Executive Committee of each Implementing Agreement.

3.2.4 Notwithstanding Article 3.2.3, no Contracting Party from an OECD non-member country or international organisation shall have greater rights or benefits than Contracting Parties from OECD member countries.

3.3 Sponsors may be

(a) entities of OECD member countries or OECD non-member countries who are not designated by the governments of their respective countries to participate in a particular Implementing Agreement; and

(b) non-intergovernmental international entities in which one or more entities of OECD member countries or OECD non-member countries participate.

3.3.1 Participation of Sponsors in Implementing Agreements requires prior approval by the CERT.

3.3.2 Prior to CERT approval of Sponsor participation in any Implementing Agreement, the Executive Committee shall:

(a) have voted in favour of the applicant to join the Implementing Agreement and provide evidence of the same to the CERT;

(b) provide the CERT with a copy of the terms and conditions of the applicant's participation in the Implementing Agreement; and

(c) provide the CERT with a letter from the applicant expressing the applicant's desire to join the Implementing Agreement and specifying which Annexes it wishes to join; its acceptance of the terms and conditions of the Implementing Agreement; and the name of the entity that will sign the Implementing Agreement.

3.3.3 The terms and conditions for the admission, participation and withdrawal of Sponsors, including rights and obligations, in Implementing Agreements and their Annexes, if any, shall be established by the Executive Committee of each Implementing Agreement.

3.3.4 Notwithstanding Article 3.3.3, no Sponsor shall have greater rights or benefits than Contracting Parties from OECD non-member countries and no Sponsor shall be designated Chair or Vice-chair of an Implementing Agreement.

3.3.5 The CERT shall have the right to not approve participation of a Sponsor if the terms and conditions of such participation do not comply with this Framework, any Decisions of the CERT or the Governing Board and the Shared Goals of the IEA.

Article 4

Specific Provisions

4.1 Unless the CERT otherwise agrees, based on exceptional circumstance and sufficient justification, Implementing Agreements shall be for an initial term of up to, but no more than, five years.

4.2 An Implementing Agreement may be extended for such additional periods as may be determined by its Executive Committee, subject to approval of the CERT. Any single extension period shall not be greater than five years unless the CERT otherwise decides, based on exceptional circumstances and sufficient justification.

4.3 Notwithstanding Paragraph 4.2, should the duration of the programme of work of an Annex exceed the term of the Implementing Agreement to which it relates, the CERT shall not unreasonably withhold approval to extend the Implementing Agreement for such additional period to permit the conclusion of the work then being conducted under the Annex.

4.4 Either the Contracting Parties or the Executive Committee of each Implementing Agreement shall:

4.4.1 approve the programme activities and the annual programme of work and budget for the relevant Implementing Agreement;

- 4.4.2 establish the terms of the contribution for scientific and technical information, know-how and studies, manpower, capital investment or other forms of financing to be provided by each participant in the Implementing Agreement;
- 4.4.3 establish the necessary provisions on information and intellectual property and ensure the protection of IEA copyrights, logos and other intellectual property rights as established by the IEA;
- 4.4.4 assign the responsibility for the operational management of the programme or project to an entity accountable to the Executive Committee of the relevant Implementing Agreement;
- 4.4.5 establish the initial term of the Implementing Agreement and its Annexes;
- 4.4.6 approve amendments to the text of the Implementing Agreement and Annexes; and
- 4.4.7 invite a representative of the IEA Secretariat to its Executive Committee meetings in an advisory capacity and, sufficiently in advance of the meeting, provide the Secretariat with all documentation made available to the Executive Committee members for purposes of the meeting.

Article 5

Copyright

- 5.1 Notwithstanding the use of the IEA name in the title of Implementing Agreements, the Implementing Agreements, the Executive Committee or the entity responsible for the operational management of the programme or project may use the name, acronym and emblem of the IEA as notified to the World Intellectual Property Organisation (WIPO) only upon prior written authorisation of the IEA and solely for the purposes of executing the Implementing Agreements.
- 5.2 The IEA shall retain the copyright to all IEA deliverables and published or unpublished IEA material. Implementing Agreements wishing to use, copy or print such IEA deliverables and/or material shall submit a prior written request of authorisation to the IEA.

Article 6

Reports to the IEA

6.1 Each Executive Committee shall submit to the IEA:

- 6.1.1 as soon as such events occur, notifications of any admissions and withdrawals of Contracting Parties and Sponsors, any changes in the names or status of Contracting Parties or Sponsors, any changes in the Members of the Executive Committee or of the entity responsible for the operational management of the programme or project, or any amendments to an Implementing Agreement and Annex thereto;
- 6.1.2 annual reports on the progress of programmes and projects of the Implementing Agreement and any Annex;
- 6.1.3 notwithstanding Article 6.1.1, in addition to and with the Annual Report, annually provide the IEA with the following information:
 - (a) the names and contact details of all current Contracting Parties and Sponsors;
 - (b) the names and contact details of all Contracting Parties and Sponsors who may have withdrawn from the Implementing Agreement or any Annex in the year covered by the Annual Report;
 - (c) the names and contact details of all new Contracting Parties and Sponsors who may have joined the Implementing Agreement or any Annex in the year covered by the Annual Report;
 - (d) any changes in the names or status of any Contracting Parties or Sponsors;
 - (e) the names and contact details of the Executive Committee members and the entity responsible for the operational management of the programme or project; and
 - (f) any amendments to the text of an Implementing Agreement and any Annex thereto.

- 6.1.4 End of Term Reports, which shall include all the information and documentation required by Decisions of the CERT then in effect and relating thereto; and
- 6.1.5 at the request of the IEA, any other non-proprietary information as may be requested by the IEA in connection with the IEA's mandate.

Article 7

Effective Date

This Framework shall take effect and become binding on all participants in the Implementing Agreements and Annexes from the date of its approval as a decision by the Governing Board.

Annex I

EXCHANGE AND DISSEMINATION OF INFORMATION ON PHOTOVOLTAIC POWER SYSTEMS

1. Objective

The objective of this Task is to promote and facilitate the exchange and dissemination of information on the technical, economic, environmental and social aspects of photovoltaic power systems.

2. Means

Work in pursuit of the foregoing objective will be performed by analysts and technical writers in the Participants' countries. Participants will carry out the following Subtasks:

(a) Subtask I/1 Exchange of Information on Photovoltaic Power Systems

Participants will collect information on the technical, economic, environmental and social characteristics of photovoltaic power systems in their respective countries by means of published and unpublished written materials and, where possible, by personal interviews. They will exchange this information at annual meetings to provide input to Subtask I/2 as described below. The information is to be collected in a standard format on the following items:

Commercial, government and utility activities related to photovoltaic power systems, including the amounts of power and budgets involved;

Costs and performance of photovoltaic power systems, including stand-alone systems, distributed grid-connected systems, and large centralized systems for utilities;

Advances in the production capability of photovoltaics manufacturers with respect to modules for all applications;

Advances in the use of photovoltaic power systems by electric utilities;

Legal and institutional factors affecting the adoption of photovoltaic systems, including applicable taxes, incentives, and regulations;

Public perceptions of installed photovoltaic power systems;

- (7) The role of photovoltaic power systems in changing electricity business environments;
- (8) Impacts of manufacture and installation of photovoltaic power systems on the environment.

(b) Subtask I/2 Analysis and Dissemination of Photovoltaic Power System Information

Participants will analyze the information on photovoltaic power systems collected in Subtask I/1 in order to develop joint summary assessments of trends in photovoltaic applications. The Operating Agent will ensure that each Participant provides uniform and comparable information. Each Participant will be responsible for data collection in its country and for preparation of a brief annual report on items described in Subtask I/1. A general report assessing photovoltaics progress, with particular emphasis on the diffusion of photovoltaics in successive candidate markets, will be prepared and published to disseminate the information collected.

3. Results

The products of work performed in this Annex will be designed for use by utility executives, senior government officials, and others. Results of the joint activity will include:

- (a) Proceedings of annual meetings to exchange information on photovoltaic power systems, pursuant to Subtask I/1 as described in sub-paragraph 2(a) above;
- (b) Reports on the trends in photovoltaic applications, pursuant to Subtask I/2 as described in sub-paragraph 2(b) above.

4. Time Schedule

This Annex shall remain in force for five years. It may be extended by two or more Participants, acting in the Executive Committee, taking into account any recommendation of the Agency's Committee on Energy Research and Technology concerning the term of this Annex, and shall thereafter apply only to those Participants.²

5. Specific Responsibilities of the Operating Agent

In addition to carrying out the specific responsibilities enumerated in Article 5 of this Agreement, the Operating Agent shall:

- (a) Publish proceedings of papers presented at the annual meetings pursuant to Subtask I/1, on the topics enumerated in sub-paragraph 2(a) above;

Prepare joint assessments of trends in photovoltaic applications, pursuant to Subtask I/2 as described in sub-paragraph 2(b) above.

6. Funding

² This Annex entered into force on 16th April, 1993 pursuant to a decision by the Executive Committee in accordance with Article 2(a) of this Agreement; it was subsequently extended and will remain in force, within the term of the Agreement, until terminated by unanimous decision of the Annex Participants.

- (a) Annual Meetings. The annual meetings pursuant to Subtask I/1 shall be hosted in turn by the Participants and the hosts will sustain the expenses of local organization.
- (b) Publications. The cost of publishing the proceedings and summary assessments described in paragraph 4 above will be met by the Participants and the Common Fund respectively.
- (c) Individual Financial Obligations. Each Participant shall bear all the costs it incurs in carrying out its obligations under this Annex, including reporting and travel expenses.
- (d) Task-Sharing Requirements. The total level of effort to perform the work specified in this Annex is estimated at 5 person-years per year. A portion of the work is carried out by subcontractors, funded from the Common Fund.

7. Operating Agent

The Australian PVPS Consortium is designated as Operating Agent.

8. Information and Intellectual Property

The information on photovoltaic power systems developed under this Annex shall be confined to publicly available, non-proprietary and unclassified information.

9. Participants

The Contracting Parties which are Participants in this Annex are the following:

The Energy Research and Development Corporation (ERDC) (Australia),
 The Arsenal Research (Austria),
 The Government of Canada,
 The Commission of the European Communities,
 The Ministry of Economy and Business Affairs, Danish Energy Agency,
 L'Agence de l'Environnement et de la Maîtrise de l'Énergie (France),
 The Forschungszentrum Jülich GmbH (Germany),
 The Ministry of Energy and Infrastructure (Israel),
 The Ente per le Nuove Tecnologie, l'Energia e l'Ambiente (ENEA) (Italy),
 CESI S.p.A. (Italy),
 The New Energy and Industrial Technology Development
 Organization (NEDO) (Japan),
 The Ministry of Commerce, Industry and Energy (Korea),
 The Instituto de Investigaciones Eléctricas (IIE) (Mexico),
 SENTERNOVEM (The Netherlands),
 The Research Council of Norway,
 The National Institute for Engineering and Industrial Technology (INETI) (Portugal),
 The Secretary of Energy and Mineral Resources (Spain),
 The Swedish Energy Agency,
 The Swiss Federal Office of Energy (SFOE),
 The Marmara Research Center (MAM) of the Scientific
 and Technical Research Council of Turkey,

The Department of Trade and Industry (United Kingdom),
The United States Department of Energy (DOE),
The European Photovoltaic Industry Association (EPIA).

Annex II

PERFORMANCE, RELIABILITY AND ANALYSIS OF PHOTOVOLTAIC SYSTEMS

1. Objective

The objective of this Annex is to improve the operation, sizing, the electrical and economic output of photovoltaic power systems and subsystems by collecting, analyzing and disseminating information on their technical and economic performance and reliability, providing a basis for their performance assessment, and developing practical recommendations for grid-connected and stand-alone PV systems.

Technical information of PV operational performance, long-term reliability and performance prediction is very important for an emerging technology. Manufacturers of PV components such as modules or inverters are looking for reliable field data of performance results of PV systems from an independent source in order to gain feedback for the design of PV systems and to prove the reliability of their products. It is expected that improved design, reliable components and proven technology will significantly contribute to the increasing dissemination of photovoltaics in future.

2. Means

Work in pursuit of the foregoing objective will be performed by photovoltaic system specialists and engineers working in the fields of planning, installation and research in the Participants' countries. Participants will carry out the following Subtasks:

(a) Subtask II/1 International Database

Participants will collect information on the technical performance, reliability and costs of photovoltaic power systems and subsystems sourced from published and unpublished written materials, available monitoring data from national programmes and personal contacts. The information is gathered and presented by means of standard data collection format and definitions. The developed database allows the user to select PV system data, monitoring data and calculated results as well as export these data into spread sheet programmes. The database will be updated regularly including new PV system data from national representatives and other sources, and is distributed in a non-commercial way as widely as possible.

The Participants will additionally develop and review a web-based Performance Database using selected database information in order to build up an online database on PV system performance and reliability.

(b) Subtask II/2 Evaluation of Photovoltaic Power Systems (terminated)

(c) Subtask II/3 Measuring and Monitoring (terminated)

(d) Subtask II/4 Improving Photovoltaic Systems Performance (terminated)

(e) Subtask II/5 Technical Assessments and Technology Trends of Photovoltaic Systems

Participants will analyse and validate expertise and performance results of PV systems, both in order to ensure the quality and comparability of information gathered in the Performance Database and to identify high performance products, technologies and design methodology. This will foster the development of maximum conversion efficiency and optimum integration of PV. Activities will include:

Recommendations on the performance, acceptance and technical standardisation of PV in the built environment;
Comparing technological choices and strategies with respect to PV system reliability;
Lessons learnt and trend identification for the planners' and users' community;
Analysing the end-user's consciousness of the performance of PV systems;
Improving performance prediction in acting both on the solar resource and on the system performance sides.

(f) Subtask II/6 Photovoltaic System Cost over Time

Participants will identify and evaluate the important elements, which are responsible for the life cycle economic performance of PV systems by investigating economic data for all key components of PV systems and by gathering information about real life costs of maintenance of PV systems. An Internet-based survey will be developed, reviewed and published in order to gain additional economic data from global customers. The following aspects will be included:

Collecting and investigating economic data for the key components of PV systems;
Comparing actual data of system cost of turnkey systems for different markets in different countries as well as different sizes of installations;
Collecting data and information about real life costs of maintenance of PV systems;
Balancing the investments, the capital costs against the electrical and economical output of the PV system during its life cycle;
Predicting performance life expectancy, mean time between failure and costs to service and replace parts.

(g) Subtask II/7 Dissemination of Photovoltaic Systems Performance Analysis Results

The results of the other Subtasks will be brought to the stakeholders by disseminating the collected information and by user-oriented packaging of the results. The following activities will be carried out by the Participants:

Effective dissemination strategy of products by means of Task website, also addressing all national languages of the Participants.
Interactive workshops on PV performance prediction issues and on economic performance of PV systems;
Development of educational tools for training courses and lectures;
National seminars for PV specialists and industry in conjunction to the semi-annual meetings of the Task Participants;
Training and education (e.g. master courses for university students).

3. Results

The products of work performed in this Annex will be designed for use by photovoltaic systems specialists, power plant system designers, utility executives and photovoltaic industry. Results of the joint activity will include:

- (a) An extended international database on the technical performance and reliability of photovoltaic power systems and subsystems pursuant to work under Subtask II/1 as described in sub-paragraph 2(a) above;
- (b) Analytical reports on the technical performance, technological choices and strategies, recommendations on long-term reliability of PV systems, as well as on improved PV system performance prediction based on work under Subtask II/2 as described in sub-paragraph 2(e) above;

An executive report on PV system costs and the elements of life cycle economic performance of PV installations, pursuant to the work performed under Subtask II/6 as described in sub-paragraph 2(f) above.

Exchanging of information and knowledge with PV manufacturers, engineers and PV industry associations concerning performance of PV products and ongoing developments.

4. Time Schedule

This Annex shall remain in force for a period of three years. It may be extended by agreement of two or more Participants, acting in the Executive Committee, taking into account any recommendation of the Agency's Committee on Energy Research and Technology concerning the term of this Annex, and shall thereafter apply only to those Participants.³

5. Specific Responsibilities of the Operating Agent

In addition to carrying out the specific responsibilities enumerated in Article 5 of this Agreement, the Operating Agent shall prepare, review, revise and distribute to Participants the Performance Database, the documents and reports specified in paragraph 3 above. The Operating Agent shall be responsible for co-ordination of the activities of this Annex with other Annexes of this Agreement. Furthermore, the Operating Agent shall establish and maintain a moderate level of collaboration with the IEA Solar Heating and Cooling Agreement.

6. Funding

- (a) Database. The cost of updating and maintaining the data base on photovoltaic system performance pursuant to Subtask II/1 shall be borne by the Operating Agent.
- (b) Publications. The cost of publishing technical reports pursuant to the Subtasks of this Annex

³ This Annex entered into force on 16th April, 1993 pursuant to a decision by the Executive Committee in accordance with Article 2(a) of this Agreement; it was subsequently extended in 1999 and in 2004 and will remain in force until 31st August, 2007.

shall be met by the Operating Agent or by such Subtask Leaders as Participants may agree upon.

(c) Individual Financial Obligations. Each Participant shall bear all the costs it incurs in carrying out its obligations under this Annex, including reporting and travel expenses.

Task-Sharing Requirements. The total level of effort to perform the work specified in this Annex is estimated at 3.0 person-years per year. The expected contribution of each Participant to task-sharing under the Annex is therefore 2.0 to 4.0 person-months of effort during each year that the Annex remains in force.

Meetings. Semi-annual meetings shall be hosted in turn by the Participants and the hosts will sustain the expenses of local organization of these meetings, including the expenses for National Workshops as mentioned in Subtask II/7.

7. Operating Agent

The Forschungszentrum Jülich GmbH, Germany, acting through the Bayerisches Zentrum für Angewandte Energieforschung e.V., is designated as Operating Agent.

8. Participants

The Contracting Parties which are Participants in this Annex are the following:

The Arsenal Research (Austria),
The Government of Canada,
The Commission of the European Communities,
L'Agence de l'Environnement et de la Maîtrise de l'Énergie (France),
The Forschungszentrum Jülich GmbH (Germany),
The Ente per le Nuove Tecnologie, l'Energia e l'Ambiente (ENEA) (Italy),
CESI S.p.A. (Italy),
The New Energy and Industrial Technology Development Organization (NEDO) (Japan),
The Swedish Energy Agency,
The Swiss Federal Office of Energy (SFOE),
The Department of Trade and Industry (DTI) (United Kingdom),
The United States Department of Energy (DOE)
The European Photovoltaic Industry Association (EPIA).

Annex VIII

STUDY ON VERY LARGE SCALE PHOTOVOLTAIC POWER GENERATION SYSTEMS

1. *Objective*

The objective of this Task is to examine and evaluate the potential of Very Large Scale Photovoltaic Power Generation (VLS-PV) Systems on desert areas, which have a capacity ranging from multi-Megawatt to Gigawatt, and to develop practical proposals for demonstrative research toward realization of the VLS-PV Systems in the future.

For this purpose, in Phase I (1999-2002), key factors that enable VLS-PV systems feasibility were identified and the benefits of this system's applications for neighbouring regions were clarified as well as the potential contribution of system application to global environment protection and renewable energy utilization in the long term was clarified. Mid- and long term scenario options for making VLS-PV systems feasible in some given areas were also proposed. In Phase II (2003-2005), case studies on VLS-PV systems were carried out in depth and practical proposals for demonstrative research projects on pilot PV systems suitable for selected regions, which enable sustainable growth into VLS-PV Systems in the future, and general instruction to propose practical projects for large-scale PV system were discussed.

In Phase III (2006-2008), toward a realization of VLS-PV Systems, specific case studies from viewpoints of local, regional and global aspect are carried out, and financial and institutional scenarios and a general instruction for practical project proposals are developed. Also, considerable future technical options implementing VLS-PV system are analysed.

2. *Means*

- (a) Works in pursuit of the foregoing objective will be performed by electrical engineers, structural engineers, environmental assessment experts, photovoltaic industry specialists and related experts from several other fields in the Participants' countries. In Phase I, Participants carried out Subtask 1 to Subtask 3. In Phase II, Participants carried out Subtask 4 and 5, and extend Subtask 2. In Phase III, Participants will carry out extended Subtask 2 and 5, and new Subtask 6. The objectives of each Subtask are as follows:

(1) Subtask VIII/1 Conceptual Study of the VLS-PV System (terminated)

Participants conducted development of the conceptual configuration of VLS-PV systems by extracting the dominant parameters of the conditions in which the systems were technically and economically feasible from a life-cycle viewpoint. The criteria for selecting regions suitable for case studies of the installation of VLS-PV were identified and then the regions for the case studies nominated. Activities included:

- (i) Development of total system concept
Incorporating state-of-the-art PV fabrication technology and the future prospects of that technology, conceptual configuration of VLS-PV systems was established through extraction of the dominant parameters of production and transportation of system components, construction and operation of VLS-PV system, electricity transmission and related key issues. Potential benefits of VLS-PV system as an energy source and for neighbour region were also clarified.
- (ii) Criteria for selecting regions for case studies were compiled. The criteria involved non-technological and site-dependent parameters such as irradiation condition, climate condition, quality of land surface, flora/fauna, and other environmental issues. Regions for case study were selected based on the criteria.

(2) Subtask VIII/2 Case Studies for Selected Regions for Installation of VLS-PV Systems

Employing the concepts of VLS-PV and the criteria and other results produced under Subtask VIII/1, Participants have been undertaking case studies on VLS-PV systems for the selected regions and evaluating the resulting effects, benefits and environmental impact. Some activities have been carrying out the following work for the regions selected, and feasibility and potential of VLS-PV on deserts will be evaluated from viewpoints of local, regional and global aspect.

- (i) Case studies on a region for installation of VLS-PV system
The capacity of VLS-PV system and configuration of each component have been being assessed, considering future phase-in of modular sub-units. The assessment has been taken into account the site condition, regional electricity demand, system performance, transmission technology or other alternative options and concurrent use with other energy resources. The possibility of multipurpose use of electricity generated by the VLS-PV systems to improve the nature and socio-economic condition in the region may be investigated. Furthermore, the socio-economic and environmental impacts of installation of VLS-PV systems have been being evaluated from a life-cycle point of view.
- (ii) Potential of solar energy resource on deserts will be evaluated.

(3) Subtask VIII/3 Comprehensive Evaluation of the Feasibility of VLS-PV (terminated)

Participants undertook joint assessment of the results of the case studies performed under Subtask VIII/2, summarizing similarities and differences in the impact of VLS-PV system installation in different areas, and proposed mid- and long-term scenario options, which enabled the feasibility of VLS-PV. Activities included:

- (i) Comprehensive evaluation for the case studies
Results of case studies were integrated to develop modified comprehensive models of VLS-PV systems.
- (ii) Drafting of scenario options
By putting results of all the activities into this activity, mid- and long-term scenario options, which made VLS-PV system feasible in the future, were proposed. Institutional, organisational and financial issues were also taken into consideration.
- (iii) International symposium
An international symposium, 'Energy from the Desert', was organised in Osaka, Japan. The symposium made the conclusion of Phase I activity.

(4) Subtask VIII/4 Practical Project Proposals for Initial Stage of VLS-PV Systems for Some Desert Areas (terminated)

Participants developed practical proposals for initial stage of VLS-PV systems, which would enable sustainable growth of VLS-PV systems toward the future, for some desert areas. Some activities were carried out the following work for the regions in parallel.

- (i) Development of practical project proposal for realising VLS-PV system
Taking into account of the mid- and long term scenario studies proposed in the Subtask VIII/3 and the guideline s of Subtask VIII/5 described below, Participants developed practical proposals for initial stage of VLS-PV systems, which would enable sustainable growth of VLS-PV systems toward the future,

for some desert areas. The project proposals included system configuration, standardisation, data monitoring, budget making, training of engineers, and possible financial scenarios for sustainable growth of VLS-PV systems. Furthermore, local, regional and global environmental and socio-economic effects given by the proposed project were discussed.

(5) Subtask VIII/5 General Instruction for Practical Project Proposals to Realize VLS-PV Systems in the Future

By extracting essential knowledge from the Subtask VIII/4, detailed practical instructions and training kit for the development of other practical project proposals, to enable others to sustainably implement VLS-PV systems in the future, will be developed.

- (i) Taking into account practical experiences and governmental, financial and economic requirements for large energy and development projects, guidelines for the development of practical project proposals will be developed. By extracting essential knowledge from the Subtask VIII/4, a detailed practical instructions and a training kit for the development of other practical project proposals will be discussed.

Based on experts' experiences in the field of PV and large-scale renewable technology including industry, project developer, investor, policy-maker, etc., successful and un-successful factors for VLS-PV project, on both technical and non-technical aspects, will be clarified. Existing financial schemes will be overviewed and available financial and institutional scenarios and case studies will be also discussed.

The instructions will comprise non-technical issues such as long-term financing as well as technical issues, to enable others to sustainably implement VLS-PV systems in the future.

- (ii) An International Symposium will be organised.

(6) Subtask VIII/6 Future Technical Options for Realising VLS-PV Systems

Participants will propose and analyze various technical options for implementing VLS-PV systems, including scenarios for storage and for reliable integration of VLS-PV systems into the existing electrical grid networks. From the viewpoint of future electrical grid stability, a global renewable energy system utilizing globally dispersed VLS-PV systems as the primary electrical energy source will be also analyzed.

- (i) Electric grid network scenario
Taking into account practical experience in and requirements for the development and operation of large power grids, guidelines will be developed for the evaluation of methods for accurately forecasting the effects of passing clouds and for mitigating those effects on the operational stability of large power grids.
- (ii) Energy storages
Taking into account practical experience in and requirements for the development and operation of high capacity, rapid response energy storage systems, guidelines will be developed for the evaluation of technologies for storing energy from VLS-PV systems during times of peak solar input and distributing energy during times of high demand.
- (iii) Concentrators and other options
Various technologies will be assessed, for the economic improvement of VLS-PV via the incorporation of optical concentration. The assessment will include the

relative advantages and disadvantages of low concentration (typically < 100 X) and high concentration (typically in the 100 X – 10,000 X range) options. Further, various methods will be assessed for using VLS-PV electricity to produce hydrogen, both for energy storage purposes, and as a transportation fuel *per se*.

(b) Subtask Leaders

A Subtask Leader (“the Subtask Leader”) for each of the foregoing Subtasks will:

- (1) Co-ordinate the work performed under that Subtask;
- (2) Assist the Operating Agent in preparing the detailed Programme of Work;
- (3) Direct technical workshops and provide the Operating Agent with written summaries of workshop results;
- (4) Edit technical reports resulting from the Subtask and organize their publication.

The Subtask Leader shall be a Participant, which provides the Subtask with a high level of expertise and undertakes substantial research and development in the field of the Subtask. The Subtask Leaders shall be nominated by the Operating Agent and designated by the Executive Committee, acting by unanimity. Changes in the Subtask Leaders may be agreed to by the Executive Committee, acting by unanimity of the Participants.

3. *Results*

The products of work performed in this Annex will be designed for use by electric utility experts, public development planners, PV manufacturers, PV researchers and government officials in the Participants’ countries as well as multi-national organizations involved in aid activities. Results of the joint activity will include:

- (a) Practical proposals of VLS-PV system project for specific regions.
- (b) General instruction for project proposals to realise VLS-PV systems
- (c) Evaluation of the effects, benefits and environmental impact of VLS-PV
- (d) Mid- to long term scenario options to realise VLS-PV systems
- (e) IEA Technical Report

4. *Time Schedule*

This Annex shall remain in force for a period of three years from 2006 to 2008. Within the limits of the term of the Agreement, this Annex may be extended by two or more Participants, acting in the Executive Committee, taking into account any recommendation of the Agency’s Committee on Energy Research and Technology concerning the term of this Annex, and shall thereafter apply only to those Participants.

5. *Specific Responsibilities of the Operating Agent*

In addition to carrying out the specific responsibilities enumerated in Article 5 of this Agreement, the Operating Agent shall prepare, review, revise and distribute to Participants the documents and reports

specified in paragraph 3 above. The Operating Agent shall be responsible for co-ordination of the activities of this Annex with other Annexes of this Agreement.

6. *Funding*

- (a) *Publications.* The cost of publishing documents pursuant to the Subtasks of this Annex shall be met by the Operating Agent or by such Subtask Leaders as Participants may agree upon.
- (b) *Individual Financial Obligations.* Each Participant shall bear the costs it incurs in carrying out its obligations under this Annex, including reporting and travel expenses.
- (c) *Task-Sharing Requirements.* The total level of effort to perform the work specified in this Annex is estimated at 4.2 person-years per year. The expected contribution of each Participant to task-sharing under the Annex is 4 person-months of effort during each year that the Annex remains in force.
- (d) *Meetings.* Semi-annual meetings shall be hosted in turn by the Participants and the hosts will sustain the expenses of local organization of these meetings, including the expenses for the Symposium referred to in paragraph 2(a)(5) above.

7. *Operating Agent*

The New Energy and Industrial Technology Development Organization (NEDO), Japan, acting through Tokyo University of Agriculture and Technology (TUAT) is designated as Operating Agent.

8. *Participants*

The Contracting Parties which are Participants in this Annex are the following:

The Government of Canada
Forschungszentrum Jülich GmbH(Germany)
The Ministry of National Infrastructures (Israel)
The Ente per le Nuove Tecnologie, l'Energia e l'Ambiente (ENEA) (Italy)
ENEL S.p.A. (Italy)
The New Energy and Industrial Technology Development
Organization (NEDO) (Japan)
The Ministry of Commerce, Industry and Energy (Korea)
SENTERNOVEM (the Netherlands)
The Secretary of Energy and Mineral Resources (Spain)
The United States Department of Energy (DOE)

Annex IX

PHOTOVOLTAIC SERVICES FOR DEVELOPING COUNTRIES

1. Objective

The objective of this Annex is to further increase the overall rate of successful deployment of photovoltaic (PV) systems in developing countries, as a means of meeting the targets of the Milenium Development Goals (MDGs) This will be achieved through increased co-operation and flow of information between the IEA PV Programme and policy makers and other professionals in developing countries, development banks, multilateral and bilateral aid agencies, relevant OECD/IEA committees and other targeted groups within developing countries.

2. Means

(a) Work in pursuit of the foregoing objective will be performed by renewable energy engineers and economists and development assistance experts in the Participants' countries. Participants will carry out the following Subtasks:

Subtask IX/1: Deployment Infrastructure

Participants will collect information on specific issues relating to photovoltaic deployment in developing countries. A number of target countries will be identified by the Participants. Results will be collated into a series of Country Reports. Following this, a series of Recommended Practice Guides will be produced for a range of topics including: financing mechanisms; institutional development; training programmes; operation and maintenance; certification and accreditation; sales infrastructure; and marketing. The Guides will then be disseminated to the organizations at which they have been targeted. This work was completed in phase 1.

(2) Subtask IX/2: Support and Co-operation

Participants will stimulate awareness and interest among the targeted sectors on the technical and economic potential, social implications, opportunities and best practice of PV systems and to continue the dialogue with multilateral and bilateral agencies and development banks (initiated under Phase One). This will be achieved through three main areas of activity:

Support to Multilateral and Bilateral Donors, Development Banks and Regional Networks (continued from Phase 1); Building Linkages to WSSD Type II Initiatives; Information Dissemination, Support and Feedback. The main strategic focus for the Outreach activities will be to support the Millennium Development Goals, working with the Bonn Renewables 2004 Conference outcomes.

(3) Subtask IX/3: Technical and Economic Aspects of Photovoltaics in Developing Countries

Through the activities carried out in sub-paragraph 2(a) above, areas for further research with respect to the deployment of PV systems in developing countries will be identified. The Subtask will specifically address the three following areas: stand-alone PV systems; village grid and hybrid systems; and grid-connected PV systems. Where appropriate, information will be fed into other Annexes in order that the relevant issues can be addressed. A key area of the Subtask will be to investigate the role that could be played by electricity utilities (both local and multinational) in PV deployment. This work was completed in Phase 1.

(4) Subtask IX/4: PV Energy Services for Rural Electrification and Poverty Alleviation

Participants will review and evaluate the use of PV to provide energy for community services and the role of PV in the alleviation of poverty. The Subtask will include Economic Assessment of PV Energy Services; PV Based Energy for Water Services; PV in Health, Education and ICT; Battery Charging Stations and PV Hybrids and Mini-grids and the Role of PV in the Alleviation of Poverty.

Outouts will include publications in the form of guideline and review documents, case studies, technical and non-technical briefing notes on techno-economic aspects and the design and application of PV systems and on the role of PV in poverty alleviation.

Subtask 1X5: Market Penetration Activities.

The work will focus on emerging grid-connected and grid supporting application of PV. Participants will evaluate the techno-economic aspects of small PV Power Packs which provide back-up power supply to customers when grid supplies are cut. Case studies will be prepared and a review document addressing technical recommendation will be published.

Subtask 1X6: PV and the Koyoto Mechanisms.

Participants will examine if there is potential for financial benefits for PV through the Clean Development Mechanism (CDM). It is however anticipated that these will be small.

(b) Subtask Leaders for each of the foregoing Subtasks will:

Co-ordinate the work performed under that Subtask;

Assist the Operating Agent in preparing the detailed Programme of Work;

Direct technical workshops and provide the Operating Agent with written summaries of workshop results;

(4) Edit technical reports resulting from the Subtask and organize their publication.

The Subtask Leader shall be a Participant which provides to the Subtask a high level of expertise and undertakes substantial research and development in the field of the Subtask. The Subtask Leaders shall be proposed by the Operating Agent, and designated by the Executive Committee, acting by unanimity. Changes in the Subtask Leaders may be agreed to by the Executive Committee, acting by unanimity of the Participants.

Results

The products of work performed in this Annex will be designed for use by PV specialists, multilateral and bilateral donor agencies, development banks and other target groups from both OECD Member and non-OECD Member countries. Results of the joint activity will include:

Collation and analysis of existing publications on PV in developing countries;

Recommended Practice Guides for successful introduction and expansion of PV systems, drawing from past experiences and lessons learned from technology co-operation projects and programmes. These will be disseminated by appropriate means in selected developing countries;

Staff workshops for multilateral and bilateral agencies;

Workshops in non-OECD Member countries, co-ordinated with bilateral and/or multilateral agencies and/or non-governmental organizations;

Active participation of target groups in selected developing countries;

Dialogue and contact point with staff of multilateral and bilateral agencies;

Identification of technical issues relating to PV in developing countries.

Time Schedule

This Annex shall remain in force for a period of five years until 2nd May, 2009. Within the limits of the term of the Agreement, this Annex may be extended by two or more Participants, acting in the Executive Committee, taking into account any recommendation of the Agency's Committee on Energy Research and Technology concerning the term of this Annex, and shall thereafter apply only to those Participants.

5. Specific Responsibilities of the Operating Agent

In addition to carrying out the specific responsibilities enumerated in Article 5 of this Agreement, the Operating Agent shall prepare, review, revise, and distribute to the Participants the documents and reports specified in paragraph 3 above.

6. Funding

Publications. The cost of publishing documents pursuant to the Subtasks of this Annex shall be met by the Operating Agent or by such Subtask Leaders as Participants may agree upon.

Individual Financial Obligations. Each Participant shall bear all the costs it incurs in carrying out its obligations under this Annex, including reporting and travel expenses.

Task-Sharing Requirements. The total level of effort to perform the work specified in this Annex is estimated at 4 person-years per year. The expected contribution of each Participant to task-sharing under the Annex is therefore at least 0.3 person-years of effort during each year that the Annex remains in force.

7. Operating Agent

The Department of Trade and Industry, acting through IT Power Ltd., United Kingdom, is designated as Operating Agent.

8. Participants

The Contracting Parties which are Participants in this Annex are the following:

The Energy Research and Development Corporation (ERDC) (Australia),
The Government of Canada,
The Ministry of Economy and Business Affairs, Danish Energy Agency,
L'Agence de l'Environnement et de la Maîtrise de l'Énergie (France),
Forschungszentrum Jülich GmbH(Germany),
The Ente per le Nuove Tecnologie, l'Energia e l'Ambiente (ENEA) (Italy),
CESI S.p.A. (Italy),

The New Energy and Industrial Technology Development Organization (NEDO) (Japan),
The Swedish Energy Agency,
The Swiss Federal Office of Energy (SFOE)⁴,
The Department of Trade and Industry (United Kingdom),
The United States Department of Energy (DOE)
The European Photovoltaic Industry Association.

⁴ See footnote 7.

Annex X

URBAN SCALE PHOTOVOLTAIC APPLICATIONS

1. Objective

The objective of this Annex is to enhance the opportunities for wide-scale, solution-oriented application of photovoltaic power electricity production in the urban environment as part of an integrated approach that maximizes building energy efficiency and solar thermal and photovoltaic usage. Value analysis, policy incentives, analysis tools as well as system design and integration that have proven successful in the IEA PVPS participating countries will be developed to the extent possible into a uniform international set of tools for the global market.

2. Means

(a) Work in pursuit of the foregoing objective will be performed by the broad scope of stakeholders for which the work products will be targeted, with the exception of end-users, including the building sector, government agencies, finance and insurance sector, PV industry, electricity sector and educational institutions.

Participants will carry out the following Subtasks:

(1) Subtask X/1 Economics and Institutional Factors

This subtask seeks to provide opportunities for stakeholders to look beyond a single-ownership scenario to the larger multiple stakeholder value. In this way, utility tariffs, community policy, and industry deployment strategy can be used to create scenarios which combine all stakeholder values to the PV system investor through sustained policy-related market drivers. Activities will include:

- (i) Develop a value matrix of stakeholders by the extended value stream beyond (and including) the economic market drivers;
- (ii) Derive recommendations for stakeholders to remove barriers to mass market uptake of PV;
- (iii) Analyze the economic contribution of market drivers -- financing, policy, environmental and rate structure issues -- and develop best practice scenarios;
- (iv) Promote trans-boundary transfer of lessons learned;
- (v) Identify participating country industry roadmaps and produce guide for roadmap development.

(2) Subtask X/2 Urban Planning, Design and Development

This subtask focuses on infrastructure planning and design resolution needed to achieve the vision of significantly increased deployment of PV in the urban environment. The subtask will integrate PV with standard community building practices. Activities will include:

Develop guidance for integrating PV into standard whole building design models, rating tools, and building development practices with emphasis on the building integration properties of PV for efficiency gains;

Develop guidance to integrate PV and the whole community energy infrastructure element into urban planning practices and provide processes and approach for setting quantifiable urban PV goals and objectives in the planning process. Considerations will include building aesthetics, land use; shading; urban renewal; community energy use forecast and planning impacts related to the whole building approach; and coordinated utility or community system load control to reduce demand and increase PV capacity value.

(3) Subtask X/3 Technical Factors

This subtask concentrates on technical development factors for mainstream urban-scale PV. Large-scaled urban integration of BIPV systems faces technical challenges related to synergetic use as building material and for energy supply purposes. Other challenges involve the potentially negative impact on the grid and obstacles posed by the regulatory framework. The aim of this subtask is to

demonstrate best practices and to advocate overcoming those barriers associated with extensive penetration of BIPV systems on urban scale. The deliverables focus on the broad set of stakeholders required to achieve the vision such as the building product industry, builders, utilities and PV industry. Activities include:

Identify the building material and energy use synergies of PV and of balance of system and update the existing Task VII database of products and projects for BIPV. A major aspect of the building integration will be building energy management integration and coordinating energy use with lighting and HVAC systems to assure demand reduction and capacity value;

Identify existing codes and standards applicable to urban scale PV and the needs for developing new codes and standards. Both electrical and structural codes will be evaluated. Network codes and standards will be evaluated in a separate activity. This work will build upon work initiated in Tasks V and VII;

Analyze electricity network effects, benefits, impacts, and issues. Interconnection, operational effects, and market issues will be included;

Review certification practices and define harmonized standard test procedures and transfer to the relevant stakeholders and standards committees.

(4) Subtask X/4 Targeted Information Development and Dissemination

This subtask will carry out the information dissemination of all deliverables produced in Task X. Activities include:

- (i) Review activities developed in other subtasks to assure the results are useful to the targeted stakeholders;
- (ii) Encourage participating countries to translate documents and workshop materials;
- (iii) Organise countries to host technical development and outreach workshops.
- (iv) Develop a PV project education tool, incorporating other deliverables from the task;
- (v) Hold a marketing competition for urban scale PV with the winner of the competition announced at a forum on PV for the venture capital sector;
- (vi) Conduct market research for the purpose of understanding and targeting stakeholder perceptions.

(b) Responsibilities

The responsibility for carrying out the work for Task 10 will take a tiered project management approach. Each project management tier will report up to the next tier level and assist with coordination at the lower tier level. The Project Manager (Operating Agent) will have overall Task project management responsibility. The Subtask leaders will manage the Subtask activities as an overall project. Activity Leaders will have the primary responsibility for producing the deliverables for 'their' activity within an agreed timeframe. Specifically, the responsibilities for each project management tier will be:

(1) Project Manager

- (i) Coordinate, schedule and communicate between Subtasks, including Task-level meetings;
- (ii) Report to PVPS Executive Committee and comments integration/dissemination;
- (iii) Coordinate with other PVPS Tasks; and
- (iv) Coordinate with other IEA implementing agreements, IEA Solar Heating and Cooling Agreement, Energy Conservation in Buildings and Community Systems Programme.

(2) Subtask Leaders

- (i) Coordinate, schedule and communicate between Activities, including Subtask level meetings;
- (ii) Assist Activity Leaders with engaging stakeholder/participant experts;
- (iii) Assist with information required to complete the deliverables for each activity; and
- (iv) Report and coordinate at the Task level with other Task leaders and the Project manager.

This includes a status report to the program manager one month prior to the Task meeting and ExCo meeting each held twice per year. Particular emphasis will be coordination with Subtask 4 and/or PVPS Task 1 for deliverable drafts, and final product dissemination.

(3) Activity Leaders

- (i) Produce deliverables. The remaining countries participating in an activity will be expected to respond to requests for information promptly and reasonably comprehensively.
- (ii) Provide a status report to the Subtask Leader two month prior to the Task meeting held twice each year

Task-level Experts meetings chaired by the Operating Agent will take place every six months and will be concerned with reviewing progress and coordinating work at the 'whole of Task' level. Given that the Task 10 stakeholders are a diverse group, participating countries should nominate Experts to attend the Task-level meetings who will be able to represent the interests of all stakeholders competently and fairly. The four subtask leaders will attend and participate in all Task meetings.

3. Results

Due to the large scale of this task, large reports and data bases will be published electronically with cross referenced links and indexing. The products of work performed in this Annex will be designed for use by the stakeholders for which the task is targeted. Short technical, stakeholder targeted products will be published by activity leaders and participating countries. At the initiation of Task 10, the deliverables below were identified. However, outreach targeting specific stakeholders will be identified and developed over the work period of the Task.

Report on value analysis, barriers resolution, and market drivers as well as identifying the scenarios that combine values and barriers resolution for successful and sustainable market development both existing successes and potential;

Global urban-scale PV market roadmap;

Model on how to develop a long-term urban energy infrastructure plan which includes PV, distributed generation, and whole building design practices;

Report identifying factors and functional relationships for all components making up the PV system to best meet current and predicted market drivers as identified in subtask 1;

PV housing development database added as update to Annex VII database;

Workshops for participating country national and community government research agencies;

Multi-media educational tools and consumer aides;

Report on network benefits to PV;

Outreach materials, including flyers, status reports, PowerPoint presentation, stakeholder workshops, European 2004 PV conference presentation, and Task X Web site.

4. Time Schedule

This Annex shall remain in force for a period of five years until 31st December, 2008, or upon expiration or termination of PVPS Implementing agreement at an earlier date. Within the limits of the term of the Agreement, this Annex may be extended by two or more Participants, acting in the Executive Committee, taking into account any recommendation of the Agency's Committee on Energy Research and Technology concerning the term of this Annex, and shall thereafter apply only to those Participants.

5. Funding

Publications. The cost of publishing documents pursuant to the Subtasks of this Annex shall be met by the Subtask and Activity Leaders as Participants may agree upon.

Individual Financial Obligations. Each Participant shall bear the costs it incurs in carrying out its obligations under this Annex, including reporting and travel expenses.

(c) Task-Sharing Requirements. The total level of effort to perform the work specified in this Annex is estimated at 11 person-years. Assuming 8 participants, the expected contribution of each Participant to task-sharing under the Annex is 1.4 person-years of effort over the 5 year term of the annex or 3-4 man-months during each year that the Annex remains in force.

(d) Meetings. Semi-annual meetings shall be hosted in turn by the Participants and the hosts will sustain the expenses of local organization of these meetings.

Stakeholder Workshops(s). The stakeholder workshops(s) shall (each) be hosted by one of the Participants and the hosts will sustain the expenses of local organization of such a Conference.

6. Operating Agent

The United States Department of Energy, National Renewable Energy Laboratory, acting through Segue Energy Consulting, LLC, is designated as Operating Agent.

7. Participants

The Contracting Parties which are Participants in this Annex are the following:

The Energy Research and Development Corporation (ERDC) (Australia),

Arsenal Research (Austria),

The Government of Canada,

The Ministry of Economy and Business Affairs, Danish Energy Agency,

L'Agence de l'Environnement et de la Maîtrise de l'Énergie (France),

The New Energy and Industrial Technology Development Organization (NEDO) (Japan),

The Research Council of Norway,

The National Institute for Engineering and Industrial Technology (INETI) (Portugal),

The Swedish Energy Agency,

The Swiss Federal Office of Energy (SFOE),

The United States Department of Energy (DOE).

Annex XI

PHOTOVOLTAIC HYBRID MINI-GRIDS

1. Scope and Objective

The scope of this Annex is PV based hybrid generators that combine PV with other electricity generators and also energy storage systems. A particular focus will be on mini-grid systems in which energy generators, storage systems and loads are interconnected by a “stand-alone” AC distribution network with relatively small rated power and limited geographical area. The mini-grid concept has potential applications that range from village electrification in less developed areas to “power parks” that offer ultra-reliable, high quality electrical power to high tech industrial customers. These systems can be complex, combining multiple energy sources, multiple electricity consumers, and operation in both island (stand-alone) and utility grid connected modes.

The main goal of this Annex is to promote PV technology as a technically relevant and competitive energy source in mini-grids. It aims to enhance the knowledge-base of PV hybrid mini-grids and reduce barriers to market penetration of these systems.

The objectives of the Annex are to:

- define concepts for sustainable PV hybrid mini-grids taking into account local factors (specificity of the application, financing regimes, location, others);
- provide recommendations on individual designs (mix of technologies, architecture, size, performances, other) in order to achieve high penetration of PV as a mean to improve the quality, reliability and economics of electrification systems such as mini-grids;
- assess the potential of generation and storage technologies to be mixed with PV for hybridisation;
- and,
- compile and disseminate best-practices on PV hybrid power systems.

2. Means

Work in pursuit of the foregoing objectives will be performed by photovoltaic system specialists and engineers working in the fields of planning, installation and research in the Participants' countries. Participants will carry out the following Subtasks:

(a) Subtask XI/1 Design Issues

This Subtask addresses the complex nature of PV hybrid system design. Tradeoffs have to be made between first cost, energy efficiency, and reliability. Oversizing a system may increase reliability but also increase first cost. Undersizing a system will decrease reliability and frustrate users. The correct choice of components and system architecture is critical. The task has the following three activities

Review, analysis and documentation of current hybrid mini-grid system architectures

Evaluation and comparison of system design methodologies and tools and development of guidelines for design tools

Development of best practices for design, operation, and maintenance of PV hybrid projects

(b) Subtask XI/2 Control Issues

This Subtask addresses the need for new coordinating control mechanisms in hybrid mini-grids to maintain grid stability and to optimize the contribution of all generation sources. It has the following five activities

Investigate existing methods for stabilizing voltage and frequency in mini-grids and develop new, improved methods if required

Investigate data communication architectures and protocols for mini-grids

Develop supervisory control parameters and strategies for mini-grids

Evaluate the role of energy storage technologies to stabilize mini-grid operation

Investigate technical issues associated with autonomous and interconnected operation of mini-grids and a main utility grid.

(c) Subtask XI/3 PV Penetration in Mini-Grids

Subtask 30 addresses the goal of increasing the use of the PV resource in PV hybrid systems and displacing fossil fuel resources. It has the following two activities

Develop performance assessment criteria for PV hybrid systems that allows for objective comparison of different systems

Develop recommendations to maximize the solar fraction in hybrid systems through demand side management, dispatch strategies and optimization of the battery energy storage system.

(d) Subtask XI/4 Sustainability Conditions

Subtask 40 addresses the social, political, economic, and environmental factors necessary for successful implementation of PV hybrid power systems within mini-grids. It has the following three activities

Develop case studies that demonstrate the social and political framework for successful operation of PV hybrid systems within mini-grids

Evaluate the financial aspects of PV hybrid power systems, considering both first costs and operating costs, and determine the conditions for economic sustainability

Evaluate the environmental impacts and benefits of PV hybrid systems with focus on greenhouse gas emission mitigation and potential for recycling of system components

3. Results

The products of work performed in this Annex will be designed for use by photovoltaic systems specialists, hybrid power system designers, utility engineers concerned with interconnection of distributed energy resources, and equipment manufacturers. Results of the joint activity will include:

A “PV Hybrid and Mini-grid Design Manual” that will describe hybrid system architectures, design methodologies and tools, and best design practices.

Technical reports on control and communication mechanisms in hybrid mini-grids, outlining the results of the Subtask XI/2 activities and providing recommendations for current implementation and for further research and development.

A report describing the performance assessment criteria for PV hybrid systems developed in Subtask XI/3.

A report providing recommendations on strategies to maximize the use of PV (and other renewable energy sources) in hybrid energy systems.

Three reports, based on the case studies developed in Subtask XI/4, describing the social/political, financial, and environmental criteria for successful PV hybrid systems.

4. Time Schedule

This Annex shall remain in force for a period of five years. It may be extended by agreement of two or more Participants, acting in the Executive Committee, taking into account any recommendation of the Agency's Committee on Energy Research and Technology concerning the term of this Annex, and shall thereafter apply only to those Participants.

5. Specific Responsibilities of the Operating Agent

In addition to carrying out the specific responsibilities enumerated in Article 5 of this Agreement, the Operating Agent shall be responsible for co-ordination of the activities of this Annex with other Annexes of this Agreement.

6. Funding

Publications. The cost of publishing technical reports pursuant to the Subtasks of this Annex shall be met by such Subtask Leaders or Activity Leaders as Participants may agree upon.

Individual Financial Obligations. Each Participant shall bear all the costs it incurs in carrying out its obligations under this Annex, including reporting and travel expenses.

Task-Sharing Requirements. The total level of effort to perform the work specified in this Annex is estimated at 34 person-months per year. The expected contribution of each Participant to task-sharing under the Annex is therefore 2.0 to 5.0 person-months of effort during each year that the Annex remains in force.

Meetings. Semi-annual meetings shall be hosted in turn by the Participants and the hosts will sustain the expenses of local organization of these meetings.

7. Operating Agent

The CANMET Energy Technology Centre - Varennes of Natural Resources Canada, acting through KM Technical Services, is designated as Operating Agent.

8. Participants

The Contracting Parties which have indicated that they plan to participate in this Annex are the following:

(to be confirmed),

The Energy Research and Development Corporation (ERDC) (Australia),
The Arsenal Research (Austria),
The Government of Canada,
L'Agence de l'Environnement et de la Maîtrise de l'Énergie (France),
The Forschungszentrum Jülich GmbH (Germany),
The New Energy and Industrial Technology Development Organization (NEDO) (Japan),
The Secretary of Energy and Mineral Resources (Spain),
The Swiss Federal Office of Energy (SFOE),
The Research Council of Norway.